connected to the common line 12 through a resistor R4 for feeding of the control voltage. --

IN THE CLAIMS:

MARKED UP VERSION OF THE AMENDED CLAIMS

(Version with marking to show changes made)

1. (currently amended) Safety device [[(19)]] for limiting of current and voltage of an electrical consumer [[(15)]] connected downstream to the safety device [[(19)]] with at least one input connector [[(8)]] and one output connector [[(16)]] as well as input connector and output connector ~~(10, 17)~~ of a common line [[(12)]] wherein the safety device [[(19)]] includes at least one voltage and current limiting device ~~(7,13, 14)~~ and comprising at least one protective device [[(F 1)]] as a fusible fuse, a voltage limiter device [[(D3)]] referenced to the common line [[(12)]], a current limiter device [[(R6)]] connected to the output of the voltage limiter device [[(D3)]] as well as a protective circuit [[(20)]], which protective circuit [[(20)]] is disposed upstream at the voltage and current limiting device ~~(7,13, 14)~~, wherein the protective circuit [[(20)]] includes a field effect transistor ([[Q1)]] as a switching and regulating transistor, wherein the source drain leg [[(S-D)]] of the field effect transistor [[(Ql)]] is disposed between the input connector [[(8)]] and the voltage and current limiting device ~~(7,13, 14)~~ and

wherein [[the]] a gate [[(G)]] of the switching and regulating transistor is connected to the common line [[(12)]] through a control voltage feeding resistor [[(R4)]] for feeding in [[the]] a control voltage of the field effect transistor [[(Q 1)]], wherein a second transistor [[(Q2)]] is connected to the input connector [[(8)]] and to the gate [[(G)]] of the switching and regulating transistor [[(Q 1)]], wherein the collector of the second transistor [[(Q23)]] is connected to the gate [[(G)]] of the switching and regulating transistor [[(Q 1)]] for influencing the control voltage of the switching and regulating transistor [[(Q 1)]], and wherein a feedback voltage ~~(U9,11)~~ is fed back to the base [[(Q22)]] of the second transistor [[(Q2)]] over a feedback resistor [[(R3)]] from [[the]] an output ~~(9,11)~~ of the protective circuit [[(20)]], wherein a voltage sensor circuit ~~(D1,RS)~~ is disposed between the base [[(Q22)]] of the second transistor [[(Q2)]] and the common line [[(12)]] for voltage detection.

2. (currently amended) Safety device [[(19)]] according to claim 1 characterized in that ~~the longitudinal~~ a series resistor [[(R1)]] operates as a current sensor and the voltage sensor circuit ~~(D1,R5)~~ are present simultaneously both for voltage detection as well as for current limitation.

3. (currently amended) Safety device [[(19)]] according to claim 1 or 2 characterized in that the voltage sensor circuit ~~(D1,R5)~~ comprises a sensor ~~first~~ diode [[(D1)]] and a sensor resistor [[(R5)]] connected in series.

4. (currently amended) Safety device [[(19)]] according to claim 1 characterized in that the feedback current is adjusted by way of the feedback resistor [[(R3)]] such that in case of ~~over-load~~ overload there results a regulating down of the load current to a minimum value and a switching off of the current in the voltage and current limiting device ~~(7,13, 14)~~ is performed only upon application of a supply voltage ~~(U8-10)~~ larger than [[the]] an input nominal voltage [[(UEN)]] and wherein an automatic switching on again is
given upon following lowering of the supply voltage [[(UE)]] to the input nominal voltage [[(UEN)]].

5. (currently amended) Safety device [[(19)]] according to claim 1 characterized in that a feedback current reducing resistor [[(R2)]] is disposed between the base [[(Q22)]] of the second transistor [[(Q2)]] and [the] a source [[(S)]] of the switching and regulating transistor [[(Q 1)]] for reducing the feedback current.

6. (currently amended) Safety device [[(19)]] according to claim 1 or 2, characterized in that [[a]] the feedback voltage ~~(U9-11;UA)~~ of the feedback resistor [[(R3)]] is tappable both immediately after [[the]] a drain [[(D)]] of the switching and regulating transistor [[(Q 1)]] as well as at any arbitrary circuit point of [[the]] a current path between line points ~~(9, 16)~~ and that the feedback voltage ~~(U9-11;UA)~~ of the feedback resistor [[(R3)]] is fed back to the base [[(Q22)]] of the second transistor [[(Q2)]].

7. (currently amended) Safety device [[(19)]] according to claim 1 or 2 characterized in that a ~~second~~ protection Zener diode [[(D2)]] is disposed between the gate [[(G)]] and the source [[(S)]] of the switching and regulating transistor [[(Q 1)]] parallel to the gate [[(G)]] and to [[the]] a source [[(S)]] of the switching and regulating transistor [[(Q 1)]] for protecting the gate source leg [[(G-S)]].

8. (currently amended) Safety device [[(19)]] according to claim 1 characterized in that ~~an additional second~~ a gate control Zener diode [[(D4)]] is connected in series with the control voltage feeding resistor [[(R4)]] for reducing the gate control voltage of the switching and regulating transistor [[(Q1)]].

9. (currently amended) Safety device [[(19)]] according to claim 7 characterized in that ~~the second~~ a protection Zener diode ~~[(D2)] (D2)~~ and ~~an additional third~~ a gate control Zener diode [[(D4)]] are integral components of the switching and regulating transistor [[(Q1)]].

10. (currently amended) Safety device [[(19)]] according to claim 1 characterized in that the feedback resistor [[(R3)]] is replaced by a control circuit for adjusting the feedback current independent of the output voltage and of the supply voltage.

11. (currently amended) Safety device [[(19)]] according to claim 10 characterized in that the control circuit is a constant current circuit.

12. (currently amended) Safety device [[(19)]] according to claim 1 or 2 characterized in that the safety device [[(19)]] includes a reset device ~~, for example a key,~~ for switching on again in the protective circuit [[(20)]] after triggering of [[the]] a switching off of [[the]] a current in the voltage and current limiting device ~~(7,13, 14)~~.

13. (currently amended) Safety device [[(19)]] according to claim 1 characterized in that the second transistor [[(Q2)]] is a field effect transistor.

14. (currently amended) Safety device [[(19)]] according to claim 1 characterized in that a bipolar transistor [[are]] is employed ~~instead of~~ as the ~~field effect~~ switching and regulating transistor.

15. (currently amended) A method for limiting of current and voltage of an electrical consumer [[(15)]] involving a safety device [[(19)]] comprising the steps:

furnishing the safety device [[(19)]] with at least a voltage and current limiting device ~~(7,13, 14)~~ and with at least one protective device [[(F 1)]] as a fusible fuse, with a voltage limiter device [[(D3)]] referenced to a common line [[(12)]], with a current limiter device [[(R6)]] connected to the output of the voltage limiter device [[(D3)]] as well as with a protective circuit [[(20)]], which protective circuit (20) is disposed upstream the voltage and current limiting device ~~(7,13, 14)~~, wherein the protective circuit [[(20)]] exhibits a field effect transistor [[(Q1)]] as a switching and regulating transistor, wherein the source drain leg [[(S-D)]] of the ~~field effect~~

switching and regulating transistor [[(Ql)]] is disposed between an input connector [[(8)]] and the voltage and current limiting device ~~(7,13, 14)~~;

connecting [[the]] a gate of the switching and regulating transistor [[(G)]] to [[the]] a common line [[(12)]] through a control voltage feeding resistor [[(R4)]];

connecting a second transistor [[(Q2)]] to the input connector [[(8)]] and to the gate [[(G)]] of the switching and regulating transistor [[(Q 1)]], wherein [[the]] a collector of the second transistor [[(Q23)]] is connected to [[the]] a gate [[(G)]] of the switching and regulating transistor [[(Q 1)]] for influencing [[the]] a control voltage of the switching and regulating transistor [[(Q 1)]], and

disposing a voltage sensor circuit ~~(D1,RS)~~ between [[the]] a base [[(Q22)]] of the second transistor [[(Q2)]] and the common line [[(12)]] for voltage detection;

connecting [[the]] an electrical consumer downstream to the safety device [[(19)]] with at least one input connector [[(8)]] and one output connector [[(16)]] as well as input connector and output connector ~~(10, 17)~~ of the common line (12);

feeding in the control voltage of the ~~field effect~~ switching and regulating transistor [[(Q 1)]] from the gate [[(G)]] to the common line [[(12)]] through the control voltage feeding resistor [[(R4)]];

feeding a feedback voltage ~~(U9,11)~~ back to the base [[(Q22)]] of the second transistor [[(Q2)]] over a feedback resistor [[(R3)]] from [[the]] an output ~~(9,11)~~ of the protective circuit [[(20)]].

16. (currently amended) A safety barrier [[(19)]] for limiting the current and voltage of an electric consumer ~~(15), for example, a transducer,~~ connected after the safety barrier [[(19)]], said safety barrier [[(19)] having at least one input connection [[(8)]] and one output connection [[(16)]] as well as input and output connections ~~(10, 17)~~ of a shared line [[(12)]] ~~, for example, a ground conductor,~~ whereby the safety barrier [[(19)]] has at least one voltage and current limiter ~~(7, 13, 14) , such as a Zener barrier,~~ comprising at least one fuse ~~(F1) , such as a blow-out fase,~~ a voltage limiter [[(D3)]] linked to the shared line [[(12)]], a current limiter [[(R6)]] connected to the output of said voltage limiter [[(D3)]] as well as an additional protective circuit [[(20)]], which is arranged before the voltage and current limiter ~~(7, 13, 14)~~, characterized in that

the additional protective circuit [[(20)]] has a field effect transistor [[(Q1)]] as [[the]] a switching and/or regulating transistor whose source-drain link [[(S-D)]] is arranged between the input connection [[(8)]] and the voltage and current [[,]] limiter ~~(7, 13, 14)~~, and the gate of the switching and/or regulating transistor [[(G)]] for feeding [[the]] a control voltage of the [[field]] switching and/or regulating transistor [[(Q1)]] is connected via a control voltage feeding resistor [[(R4)]] to the shared line [[(12)]],

~~whereby~~ wherein a second transistor [[(Q2)]] is connected to the input connection [[(8)]] and to the gate [[(G)]] of the switching and/or regulating transistor (Q 1),

~~whereby~~ wherein [[the]] a collector [[($Q2_3$)]] of the second transistor [[(Q2)]], in order to influence the control voltage of the switching and/or regulating transistor

[[(Q1)]], is connected to the gate [[(G)]] thereof, and the feedback voltage ~~($U_{9,11}$)~~ after the switching and/or regulating transistor [[(Q1)] after its drain [[(D)]] is fed back between the outputs ~~(9, 11)~~ of the additional protective circuit [[(20)]] via [[the]] a feedback resistor [[(R3)]] to [[the]] a base [[($Q2_2$)]] of the second transistor [[(Q2)]], ~~whereby~~ wherein for purposes of voltage detection, there is a voltage sensing circuit ~~(D1, R5)~~ arranged between the base [[($Q2_2$)]] of the second transistor [[(Q2)]] and the shared line [[(12)]]

or

for purposes of current detection, there is a series resistor [[(R1)]] arranged between the input connection [[(8)]] and [[the]] a source [[(S)]] of the switching and/or regulating transistor [[(Q1)]] as a current sensor.

17. (currently amended) The safety barrier according to Claim 16, characterized in that,

pertaining to the additional protective circuit, concurrently for voltage detection as well as for current limitation, the series resistor [[(R1)]] is present in the form of a current sensor and the voltage sensing circuit ~~(D1, R5)~~ is present in the form of a voltage detector.

18. (currently amended) The safety barrier according to Claim 16, characterized in that

the voltage sensing circuit ~~(D1, R5)~~ comprises a sensor Zener or trigger diode [[(D1)]] and a sensor resistor [[(R5)]], which are connected in series.

19. (currently amended) The safety barrier according to Claim 16, characterized in that

[the]] a feedback current is set by means of the feedback resistor [[(R 3)]] or by means of the switching or regulating circuit in such a way that, in case of overload, [[the]] a load current is cut back to a minimum value and only after [[the]] an application of a supply voltage ~~(U_{8-10})~~ that is greater than [[the]] a rated input voltage [[(U_{EN})]] is the load current switched off in the

voltage and current limiter ~~(7, 13, 14)~~ and autonomously switched back on at the time of the subsequent lowering of the supply voltage [[(U_E)]] to the rated input voltage [[(U_{EN})]].

20. (currently amended) The safety barrier according to Claim 16, characterized in that,

in order to reduce the feedback current in the additional protective circuit, a <u>feedback current reducing</u> resistor [[(R2)]] is installed between the base [[($Q2_2$)]] of the secondtransistor [[(Q2)]] and the source [[(S)]] of the switching and regulating transistor [[(Q1)]].

21. (currently amended) The safety barrier according to Claim 16, characterized in that the reference voltage or feedback voltage ~~(U_{9-11};U_A)~~ of the feedback resistor [[(R3)]] can be tapped directly after the drain [[(D)]] of the switching and/or regulating transistor [[(Q1)]] as well as at any desired circuit point of the current path ~~between the line points 9 and 16~~ <u>through the voltage and current limiter</u>, and is fed back to the base [[($Q2_2$)]] of the second transistor [[(Q2)]].

22. (currently amended) The safety barrier according to Class 16, characterized in that, parallel to the gate [[(G)]] and the source [[(S)]] of the switching and/or regulating transistor [[(Q1)]], a protection Zener diode [[(D2)]] is applied between said gate [[(G)]] and the source [[(S)]] in order to protect the gate-source link [[(G-S)]].

23. (currently amended) The safety barrier according to Class 16, characterized in that, in order to reduce [[the]] a gate drive voltage of the switching and/or regulating transistor [[(Q1)]], a gate control Zener diode [[(D4)]] is connected [[with]] to the control voltage feeding resistor [[(R4)]].

24. (currently amended) The safety barrier according to Claim 22, characterized in that

~~the sec.~~ a protection Zener ~~diodes D2~~ diode and/or a gate contolZener diode [[D4]] are integral components of the switching and/or regulating transistor [[(Q1)]].

25. (currently amended) The safety barrier according to Claim 16, characterized in that,

in order to set [[the]] a feedback current, irrespective of [[the]] an output or supply voltage, the feedback resistor [[(R3)]] is replaced by a switching or regulating circuit.

26. (previously presented) The safety barrier according to Claim 25, characterized in that

the switching or regulating circuit is a constant current circuit.

27. (currently amended) The safety barrier according to Claim 16, characterized in that

said safety barrier has a reset means ~~, for example, a button,~~ for switching the additional protective circuit back on after [[the] a load current has been switched off in the voltage and current limiter ~~(7, 13, 14)~~.

28. (currently amended) The safety barrier according to Claim 16, characterized in that

the second transistor [[(Q2)]] is an electronic relay or field effect transistor or thyristor.

29. (previously presented) The safety barrier according to Claim 16, characterized in that

a bipolar transistor or electronic relay is used instead of the field effect transistor.

30. (currently amended) Electrical protective circuit for limiting of current and voltage, as safety barrier or other circuit to be protected, for protecting an electrical consumer [[(15)]], with at least one

input connection [[(8)]] and an output connection [[(9)]] as well as input connection and output connection ~~(10, 11)~~ of a common line ~~(12) , for example a ground line,~~ wherein a voltage and current limiting device is disposed within the protective circuit, wherein the voltage and current limiting device includes a field effect transistor [[(Q1)]] as a switching and/or regulating transistor characterized in that

~~the source-drain-legged~~ a source-drain-leg [[(S-D)]] of the ~~field-effect~~ switching and/or regulating transistor [[(Q1)]] is disposed between [[the] an input connector and [[the]] an output connector [[(8,9)]] and [[the]] a gate [[(G)]] of the switching and/or regulating transistor is connected to the common line [[(12)]] through a resistor [[(R4)]] for feeding in ~~off the~~ a

control voltage of the ~~field-effect~~ switching and/or regulating transistor [[(Q1)]] and wherein a second transistor [[(Q2)]] is connected to the input connector [[(8)]] and to the gate [[(G)]] of the switching and/or regulating transistor [[(Q1)]], wherein [[the]] a collector [[(Q23)]] of the second transistor [[(Q2)]] is connected to the gate [[(G)]] of the switching and/or regulating transistor [[(Q1)]] for influencing [[the]] a control voltage of the switching and/or regulating transistor [[(Q1)]] and wherein the output voltage after the source-drain-leg ~~source-drain-legged (S-D)~~ of the switching and/or regulating transistor [[(Q1)]] is fed back at the output connector [[(9)]] to [[the]] a base [[(Q22)]] of the second transistor [[(Q2)]] through a feedback resistor [[(R3)]], wherein a sensor Zener diode [[(DI)]] is disposed between the base [[(Q22)]] of the second transistor [[(Q2)]] and the common line [[(12)]]

or

a series resistor [[(RI)]] is disposed as a current sensor between the input connector [[(8)]] and [[the]] a source [[(S)]] of the switching and/or regulating transistor [[(21)]] for current capturing.

31. (currently amended) Electrical protective circuit for limiting of current and voltage, as safety barrier or other circuit to be protected, for protecting an electrical consumer [[(15)]], with at least one

input connection [[(8)]] and an output connection [[(9)]] as well as input connection and output connection ~~(10, 11)~~ of a common line ~~(12) , for example a ground line,~~ wherein a voltage and current limiting device is disposed within the protective circuit, wherein the voltage and current limiting device includes a field effect transistor [[(Q1)]] as a switching and/or regulating transistor characterized in that

~~the source-drain-legged (S-D)~~ a source-drain-leg of the ~~field effect~~ switching and/or regulating transistor [[(Q1)]] is disposed between the input connector and the output connector [[(8,9)]] and [[the]] a gate [[(G)]] of the switching and/or regulating transistor is connected to the common line [[(12)]] through a control voltage feeding resistor [[(R4)]] for feeding in ~~off the~~ a control voltage of the ~~field effect~~ switching and/or regulating transistor [[(Q1)]] and wherein a second transistor [[(Q2)]] is connected to the input connector [[(8)]] and to the gate [[(G)]] of the switching and/or regulating transistor [[(Q1)]], wherein the collector [[(Q23)]] of the second transistor [[(Q2)]] is connected to the gate [[(G)]] of the switching and/or regulating transistor [[(Q1)]] for influencing the control voltage of the

switching and/or regulating transistor [[(Q1)]] and wherein [[the]] an output voltage after the ~~source-drain-legged (S-D)~~ source-drain-leg of the switching and/or regulating transistor [[(Q1)]] is fed back at the output connector [[(9)]] to [[the]] a base [[(Q22)]] of the second transistor [[(Q2)]] through a feedback resistor [[(R3)]], wherein a sensor Zener diode [[(DI)]] is disposed between the base [[(Q22)]] of the second transistor [[(Q2)]] and the common line [[(12)]]

32. (currently amended) Electrical protective circuit for limiting of current and voltage, as safety barrier or other circuit to be protected, for protecting an electrical consumer [[(15)]], with at least one

input connection [[(8)]] and an output connection [[(9)]] as well as input connection and output connection ~~(10, 11)~~ of a common line ~~(12) , for example a ground line,~~ wherein a voltage and current limiting device is disposed within the protective circuit, wherein the voltage and current limiting device includes a field effect transistor [[(Q1)]] as a switching and/or regulating transistor characterized in that

a series resistor [[(RI)]] is disposed as a current sensor between the input connector [[(8)]] and [[the]] a source [[(S)]] of the switching and/or regulating transistor [[(21)]] for current capturing.